

Warmup.

1.  $0 = 2x^2 - 4x - 5$

- Find the Discriminant
- Describe the nature of the roots
- Find the exact roots using the quadratic formula

2. Find k such that there is a double real root.

$2x^2 - 3x + k = 0$



## 6-6 Analyzing Graphs of Quadratic Functions

Vertex Form

$$y = a(x-h)^2 + k$$

Vertex (h, k)

a.o.s.  $x = h$ 

Write the equation in vertex form.

ex

$y = x^2 - 6x + 11$

$$y - 11 = x^2 - 6x + 9$$

$$y - 2 = (x - 3)^2$$

$$y = (x - 3)^2 + 2$$

Graph it!

$$V(3, 2) \quad x = 3$$

h translates the graph horizontally

k translates the graph vertically

a controls the direction and opening

Write the equation in vertex form.

ex

$y = 3x^2 + 2x$

$$y = 3\left(x^2 + \frac{2}{3}x + \frac{1}{9}\right)$$

$$y + \frac{1}{3} = 3\left(x + \frac{1}{3}\right)^2$$

$$y = 3\left(x + \frac{1}{3}\right)^2 - \frac{1}{3}$$

$$V\left(-\frac{1}{3}, -\frac{1}{3}\right)$$

What did  
I really  
add?

Write the equation in vertex form.

ex

$y = -2x^2 + 20x - 35$

$$y + 35 = -2x^2 + 20x$$

$$y + 35 = -2(x^2 - 10x + 25)$$

$$y - 15 = -2(x - 5)^2$$

$$y = -2(x - 5)^2 + 15$$

$$x = 5 \quad V(5, 15)$$

Write the equation in vertex form.

ex

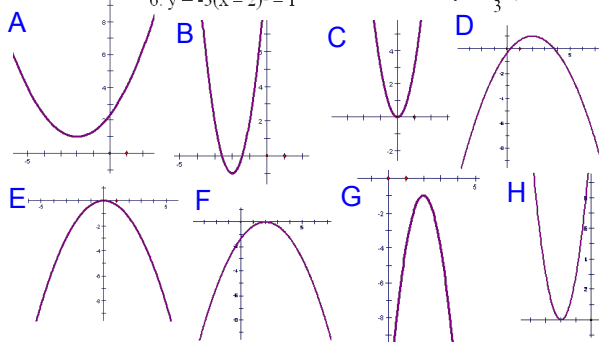
$$y = 4x^2 + 2$$

$$V(0, 2)$$

Matching

1.  $y = 3x^2$       2.  $y = -\frac{1}{3}x^2$       3.  $y = 3(x+2)^2$       4.  $y = 3(x+2)^2 - 1$

5.  $y = \frac{1}{3}(x+2)^2 + 1$       6.  $y = -3(x-2)^2 - 1$       7.  $y = -\frac{1}{3}(x-2)^2$       8.  $y = \frac{-1}{3}(x-2)^2 + 1$



Game

HW  
p326  
15-31 odd

Write each quadratic function in vertex form, if not already in that form. Then identify the vertex, axis of symmetry, and direction of opening.

15.  $y = -2(x+3)^2$

17.  $y = 5x^2 - 6$

19.  $y = -x^2 - 4x + 8$

21.  $y = -3x^2 + 12x$

23.  $y = 4x^2 + 8x - 3$

25.  $y = 3x^2 + 3x - 1$

Graph each function.

27.  $y = 4(x+3)^2 + 1$

29.  $y = \frac{1}{4}(x-2)^2 + 4$

31.  $y = x^2 + 6x + 2$